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Clogged Brain Drains May Be An Early Warning Sign Of Alzheimer's

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AsianScientist (Jan. 10, 2026) – Clogged drainage pathways in the brain might be a warning for Alzheimer's disease. These 'drains', which surround blood vessels, are filled with cerebrospinal fluid that helps to flush out neurological waste material. Conditions like arterial stiffening and hypertension can disrupt this passage, causing waste to accumulate. When that happens, the 'drains', known as perivascular spaces, become enlarged.

Researchers from Nanyang Technological University (NTU), Singapore, have found that enlarged perivascular spaces (EPVS) are more likely in those individuals who show early signs of Alzheimer's disease.

"Since these brain anomalies can be visually identified on routine magnetic resonance imaging (MRI) scans performed to evaluate cognitive decline, identifying them could

complement existing methods to detect Alzheimer's earlier, without having to do and pay for additional tests," said associate professor Nagaendran Kandiah from NTU's Lee Kong Chian School of Medicine (LKCMedicine) who led the study.

Early detection of Alzheimer's is important, according to Justin Ong, first author of the study and fifth-year LKCMedicine student. It allows clinicians to intervene earlier to slow the progression of cognitive issues like memory loss, slower thinking abilities and mood changes.

As the connection between EPVS and Alzheimer's had previously been unclear, the NTU team set out to compare EPVS to more well-established indicators of Alzheimer's disease.

This study also filled a crucial gap in research by recruiting Singaporean participants across multiple ethnic groups. Many Alzheimer's studies focus on Western populations, but their findings may not always apply to other ethnicities. "For example, among Caucasians with dementia, past studies show that the prevalence of a major risk gene, apolipoprotein E4, linked to Alzheimer's is around 50 to 60 percent. But among Singapore dementia patients, it is less than 20 percent," said Kandiah.

The researchers studied 979 Singaporeans, comparing participants with mild cognitive impairment to those without.

Based on MRI scans, participants with mild cognitive impairment were more likely to have EPVS than unimpaired participants.

They also measured seven biomarkers linked to Alzheimer's disease. Participants with EPVS were more likely to have four of the seven biomarkers, including amyloid plaques and tau tangles, placing them at higher risk of Alzheimer's disease.

The researchers also investigated white matter damage, a well known indicator of Alzheimer's. This was linked to six out of seven of the biomarkers. However, in participants with mild cognitive impairment, Alzheimer's biomarkers were more strongly associated to EPVS than to white matter damage. This suggests that EPVS could be an early indicator of Alzheimer's disease.

"The findings carry substantial clinical implications," said Kandiah. "Although white matter damage is more widely used in clinical practice to evaluate for dementia, as it is easily recognised on MRI scans, our results suggest that enlarged perivascular spaces may hold unique value in detecting early signs of Alzheimer's disease."

This link between EPVS and Alzheimer's disease means that MRI could someday become viable as an accessible tool for early diagnosis, allowing clinicians to detect and delay the development of Alzheimer's before further disease progression.

The researchers plan to continue following up with the study's participants to determine how many of them eventually develop Alzheimer's disease, and further confirm if EPVS

could predict the likelihood of developing dementia.

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Source: Nanyang Technological University, Singapore; Image: Elif Bayraktar/shutterstock

This article can be found at: Association of Enlarged Perivascular Spaces With Early Serum and Neuroimaging Biomarkers of Alzheimer Disease Pathology

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